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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/590,209	**Applicant(s)** NAVEN ET AL.	
	Examiner IQBAL ZAIDI	**Art Unit** 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having application No 10590209 filed on 06/27/2008 is presented for examination by the examiner.

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R 1.63.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 10/18/2006 and 08/22/2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-5, 8-15, and 18** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Gupta et al. (US 7286552, Oct. 23, 2007) hereinafter (Gupta).

Regarding **Claim 1**, Carlsen discloses a method of congestion management within a switch or network of connected switches wherein the or each of the switches has a plurality of ingress ports and a plurality of egress ports *(page 1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric can be a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_qorts (fabric ports) on the switch. Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL)*, the method comprising: when congestion is detected at a first ingress or egress port *(page 1, If a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected)*, sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream*

switch will then stop sending data on the affected virtual channel(particular port)) and requesting storage at the upstream port of data packets destined for that port*(page 3, See Fig 1, shows block 180 data packets stored in ingress memory subsystem (IMS) destined for that port, the iMS 180 assigns this packet a packet ID (or "PID") that indicates the cell buffer address in the iMS 180 where the packet is stored).*

Carlsen discloses all aspects of the claimed invention, except *dependence on the amount of data packets destined for the congested port stored at said upstream port, sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the congested port, said further upstream port storing at said further upstream port data packets destined for the congested port.*

Gupta is the same field of invention teaches dependence on the amount of data packets destined for the congested port stored at said upstream port *(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested),* sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the congested port, said further upstream port storing at said further upstream port data packets destined for the congested port *(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become*

congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades(ports)).

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Regarding **Claim 2,** Carlsen discloses upstream port, allocating memory for use as a set-aside-queue for data packets destined for the congested port *(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within*

switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)

Regarding **Claim 3**, Carlsen discloses upstream port creating an entry in a memory to indicate that congestion has occurred at the particular port *(page 2, switch to determine the status of a particular port, the internal switch destination address is submitted to the XOFF mask, this address is used to reference the status of that destination in the lookup table, and the resulting signal indicates the status of the indicated destination port).*

Carlsen discloses all aspects of the claimed invention, except *checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is directed to the congested port, storing said packet in the corresponding set aside queue.*

Gupta is the same field of invention teaches checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is directed to the congested port, storing said packet in the corresponding set aside queue*(column 16, At decision block 360, before resuming normal packet rates for dequeuing packets from the identified ingress queues, the ingress queue manager first checks whether congestion on all of the egress queues to which the identified ingress queues can send has now subsided).*

Regarding **Claim 4**, Carlsen discloses the method comprising within the upstream port, allocating one or more set aside queues in dependence on messages received from the first port *(page 10, and ingress memory subsystem so as to establish a separate queue for each destination on the switch)*.

Regarding **Claim 5**, Carlsen discloses further comprising within the upstream port controlling data flow into and out of the set aside queue in dependence on the congestion*(page 10, ingress memory subsystem so as to establish a separate queue for each destination on the switch, monitoring an amount of data in each queue in the ingress memory subsystem; submitting a congestion event to each port on the first I/O board when the amount of data in a first queue passes a threshold value; and maintaining at each port a destination lookup table containing a congestion value for each destination on the switch based upon the congestion events)*.

Regarding **Claim 8**, Carlsen discloses in which the message requesting establishment of a set aside queue is discarded by the upstream port if the congestion identified in the request is further downstream than the original congestion *(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*.

Regarding **Claim 9**, Carlsen discloses in which the message indicating that congestion has occurred includes a token to be kept by the upstream port to identify the upstream port as a leaf port within a congestion tree*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).*

Regarding **Claim 10**, Carlsen discloses comprising storing data about the number of leaves in the congestion tree in each switch in the tree *(See Fig 1, shows storing data in the processor 124 about the number of ports)*.

Regarding **Claim 11**, Carlsen discloses in which when a set aside queue is de-allocated, the leaf token is returned by the upstream switch to the adjacent downstream switch, the method comprising maintaining a record relating to leaf switches that have returned a leaf token*(page 5, The cells are then removed from the 0-COS-Q 280 and are submitted to the PPD 262 for the egress port 114, which converts the cells back into a Fibre Channel frame and sends it across the ISL 230 to the downstream switch 270).*

Regarding **Claim 12**, Carlsen discloses comprising when a subsequent packet is received by the upstream port *(page 1, sends an XOFF message so informing the*

upstream switch), if it is destined for the congestion, storing it in the set aside queue*(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)*, and if it is not destined for the congestion, storing it in a cold queue at the upstream port.

Regarding **Claim 13**, Carlsen discloses comprising when a packet is received at the upstream port that is destined for the congestion*(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)*, storing a marker in the cold queue to provide an indication of the order in which the congestion-bound packet was received with respect to packets already in the cold queue which are also destined for the

congestion *(page 7, the lookup table 410 in order to generate the defer signal 414. This means that whenever the gross-xoff signal 522 is set, the defer signal 414 will also be set, effectively stopping all traffic to the iMS 180, when the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402).*

Regarding **Claim 14**, Carlsen discloses wherein the memory is provided as an associative memory *(Data is stored in a memory subsystem queue associated with the destination port at the ingress side of the crossbar).*

Regarding **Claim 15**, Carlsen discloses in which the associative memory is equipped with a binary command vector operable to engage search logic which in one case is for a set aside queue formation request and thereby performs a minimal length matching operation on the contents of the associative memory and in the case of the assignment of a data packet to a pre-existing set aside queue, thereby performs a maximal length matching operation on the contents of the associative memory*(page 8, When the update signal 416 is made active by the header select 406 portion of the queue control module 400, the entire content of the lookup table 422 in the XON history register 420 is transferred to the lookup table 410 of the XOFF mask 408. Registers within the table 422 containing a zero (having a status of XON) will cause corresponding registers within the XOFF mask lookup table 410 to be reset to zero. The dual register*

setup allows for XOFFs to be written directly to the XOFF mask 408 at any time the cell credit manager 440 requires traffic to be halted, and causes XONs to be applied only when the logic within the queue control module 400 allows for a change to an XON value. While a separate queue control module 400 and its associated XOFF mask 408 is necessary for each port 110 in the PPD 130, only one XON history register 420 is necessary to service all four ports 110 in the PPD 130, which again is shown in FIG. 9).

Regarding **Claim 18**, Carlsen discloses all aspects of the claimed invention, except *wherein a pair of additional inverted bits are used to delineate the start and stop positions of the active section of a turnpool thereby to create a sized mask.*

Gupta is the same field of invention teaches wherein a pair of additional inverted bits are used to delineate the start and stop positions of the active section of a turnpool thereby to create a sized mask*(column 8, the bitmask comprises 16 bits(mask size), with one bit for each of the blades 102. For instance, in the egress queue flags 124 on Blade 2, the fourth egress queue flag, representing the state of backplane congestion to Blade 4, may have a l in the 5' and 9' bits, and zeroes in the 2 and remaining bits).*

Carlsen discloses all aspects of the claimed invention, except *checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is directed to the congested port, storing said packet in the corresponding set aside queue.*

Gupta is the same field of invention teaches checking packets subsequently received at the upstream port against the entry in the memory and, if a packet is

directed to the congested port, storing said packet in the corresponding set aside queue*(column 16, At decision block 360, before resuming normal packet rates for dequeuing packets from the identified ingress queues, the ingress queue manager first checks whether congestion on all of the egress queues to which the identified ingress queues can send has now subsided).*

6. **Claims 6-7** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Pauwels et al. (EP 1271856, Jun. 18, 2001) hereinafter (Pauwels).

Regarding **Claim 6**, Carlsen discloses all aspects of the claimed invention, except *de-allocating the one of more set aside queues in dependence on one or more criteria.*

Pauwels is the same field of invention teaches de-allocating the one of more set aside queues in dependence on one or more criteria*(Pauwels, column 4, the flow control system comprises a flow control function including means for insuring a reallocation of flow queues from means for controlling flows for a virtual ingress to egress flow control pipe to means for controlling flows for another virtual ingress to egress flow control pipe, to avoid traffic packet disordering(criteria) due to traffic shift from a first pipe(queue) to a said another pipe or vice-versa and maintain cell sequence integrity).*

Carlsen and Pauwels are analogous art because they are from the same field of

endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Pauwels because it is providing a system for obtaining an efficient and scaleable flow control in a large switching network and particularly in a packet switched network which is fit for Internet protocol IP and/or multiprotocol label switching MPLS.

Regarding **Claim 7**, Carlsen discloses all aspects of the claimed invention, except *in which the one or more criteria include the amount of data in the set aside queue.*

Pauwels is the same field of invention teaches in which the one or more criteria include the amount of data in the set aside queue*(Pauwels, column 4, according to the invention, there is a distributed flow queue identification function receiving flow queue identifications, for the queues associated to the two pipes linking all ports of an ingress board to a port of an egress board, and providing these identifications either unchanged or converted, according to non-congestion or congestion statuses(criteria) negotiated at the ingress level from non-congestion or congestion information provided for at the level of the channels of the egress board, to have the packets transmitted either by the first pipe which is reserved for non-congested traffic or by the second pipe which handles congested traffic)*.

7. <u>**Claims 16-17**</u> are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Pauwels et al. (EP 1271856, Jun. 18, 2001) hereinafter (Pauwels).

Regarding **Claim 16**, Carlsen discloses comprising following receipt of a set aside queue establishment message by the upstream switch *(page 5, the upstream switch by performing flow control for the virtual channel 240 assigned to that V-I-Q 282).*

Carlsen discloses all aspects of the claimed invention, except *the resulting binary vector that represents the path between the current switch network position and the final congested network destination is left aligned to the index of the current switch position and equipped with a mask, the mask being the size of the bit field describing the route to the congested destination prior to storage in an associative memory element.*

Pauwels is the same field of invention teaches the resulting binary vector that represents the path between the current switch network position and the final congested network destination is left aligned to the index of the current switch position and equipped with a mask, the mask being the size of the bit field describing the route to the congested destination prior to storage in an associative memory element*(Pauwels, column 3, at least one other virtual ingress to egress flow control pipe(binary vector) handles all the traffic, between the two switching network ports, towards communication channels for which congestion is detected at the level of the egress termination board and as long as such a congestion is detected).*

Carlsen and Pauwels are analogous art because they are from the same field of

endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Pauwels because it is providing a system for obtaining an efficient and scaleable flow control in a large switching network and particularly in a packet switched network which is fit for Internet protocol IP and/or multiprotocol label switching MPLS.

Regarding **Claim 17**, Carlsen discloses whereby data applied to a search register of the associative memory is prior to searching the associative memory elements at its current switch position in a network, left aligned to the index of the current switch network position and equipped with a mask for the purposes of comparison with the stored elements of the associative memory *(page 2, XON history register(search register) that also tracks the current status of all ports, this XON history register receives the XOFF signals from the cell credit manager and reflects those changes in its own lookup table(index). The values in the look up table in the XON history register are then used to periodically update the values in the look up table in the XOFF mask).*

8. **Claims 19-21, 23-25** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Gupta et al. (US 7286552, Oct. 23, 2007) hereinafter (Gupta).

Regarding **Claim 19**, Carlsen discloses A signaling protocol for managing congestion within a network of switches*(A congestion notification mechanism(signaling protocol) provides a congestion status for all destinations in a switch at each ingress port)*, the protocol comprising: a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream switch will then stop sending data on the affected virtual channel(particular port))*, the first message requesting establishment at the upstream port of a set aside queue*(page 5, the upstream switch by performing flow control for the virtual channel 240 assigned to that V-I-Q 282).*

Carlsen discloses all aspects of the claimed invention, except *for storing data packets received by the upstream switch destined for the source of, the message including a token for storage by said upstream port congestion.*

Gupta is the same field of invention teaches for storing data packets received by the upstream switch destined for the source of, the message including a token for storage by said upstream port congestion *(column 17, at process block 402, the egress queue manager 106 receives a congestion message 124 that uniquely identifies a congested egress queue (B, P, Q) whose multicast scheduling flag 114(token) has been set. The congestion message 124 may have been generated by the egress queue manager 106 on the local blade B or another source blade in the router. At decision block 404, the egress queue manager 106 further determines whether the port P*

identified in the congestion message identifier (B, P, Q) is a backplane port 11SB or an outer port 11SA. When the port P is a backplane port 11SB, then the congested egress queue 112 is a backplane queue 112B. This implies that the backplane 104 is congested for all of the traffic (multicast or unicast) destined to the destination blade B' that corresponds to the subchannel associated with the port P in the egress queue identifier (B, P, Q)).

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Regarding **Claim 20**, Carlsen discloses comprising an acknowledgement message for sending from the upstream port to the first port to confirm establishment of the requested set aside queue*(page 5,See Fig 4, FIG. 4 also shows a virtual input*

queue structure 282 within each ingress port 112 in downstream switch 270. Each of these V-I-Qs 282 corresponds to one of the virtual channels 240 on the ISL 230, which in turn corresponds to one of the 0-COS-Qs 280 on the upstream switch).

Regarding **Claim 21**, Carlsen discloses comprising a flow control message for sending from the first port to the upstream port including data relating to the congestion at the first port*(page 5, FIG. 4 also shows a virtual input queue structure 282 within each ingress port 112 in downstream switch 270. Each of these V-I-Qs 282 corresponds to one of the virtual channels 240 on the ISL 230, which in turn corresponds to one of the 0-COS-Qs 280 on the upstream switch. By assigning frames to a V-I-Q 282 in ingress port 112, the downstream switch 270 can identify which 0-COS-Q 280 in switch 260 was assigned to the frame, a particular data frame encounters a congested port within the downstream switch 270, the switch 270 is able to communicate that congestion to the upstream switch by performing flow control for the virtual channel 240 assigned to that V-I-Q 282)*

9. **<u>Claims 22</u>** is rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Pauwels et al. (EP 1271856, Jun. 18, 2001) hereinafter (Pauwels).

Regarding **Claim 22**, Carlsen discloses all aspects of the claimed invention, except *comprising a notification for sending from the upstream port to the first port*

informing the first port of de-allocation of the set aside queue when a set aside queue is no longer required.

Pauwels is the same field of invention teaches comprising a notification for sending from the upstream port to the first port informing the first port of de-allocation of the set aside queue when a set aside queue is no longer required*(Pauwels, column 4, the flow control system comprises a flow control function including means for insuring a* <u>*reallocation*</u> *of flow queues from means for controlling flows for a virtual ingress to egress flow control pipe to means for controlling flows for another virtual ingress to egress flow control pipe, to avoid traffic packet disordering(criteria) due to traffic shift from a first pipe(queue) to a said another pipe or vice-versa and maintain cell sequence integrity).*

Carlsen and Pauwels are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Pauwels because it is providing a system for obtaining an efficient and scaleable flow control in a large switching network and particularly in a packet switched network which is fit for Internet protocol IP and/or multiprotocol label switching MPLS.

Regarding **Claim 23**, Carlsen discloses comprising a message for informing the first port that the upstream port has de-allocated an old set aside queue*(page 7, a force defer signal that is controlled by the microprocessor 124 is also able to cause the defer*

signal 414 to go on. When the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402).

Regarding **Claim 24,** Carlsen discloses comprising a message for sending to the upstream port from the first port instructing the upstream port to modulate its rate of packet transmission to a specified downstream set aside queue *(page 2, See Fig. 4, FIG. 4 is a block diagram showing the queuing utilized in an upstream switch and a downstream switch communicating over an interswitch link).*

Regarding **Claim 25,** Carlsen discloses all aspects of the claimed invention, except *in which when a certain amount of data packets are stored within the set aside queue in said upstream port a message containing a token is sent by said upstream port* ***to*** *a further upstream port requesting establishment of a set aside queue at said further upstream port for storage of data packets destined for the first port at which congestion has been detected.*

Gupta is the same field of invention teaches in which when a certain amount of data packets are stored within the set aside queue in said upstream port a message containing a token is sent by said upstream port *(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)* to a

further upstream port requesting establishment of a set aside queue at said further upstream port for storage of data packets destined for the first port at which congestion has been detected*(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades(ports))*.

10. **Claims 26-28, and 35** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Lyon et al (US 20050147032, Jul. 7, 2005) furthermore Gupta et al. (US 7286552, Oct. 23, 2007)

Regarding **Claim 26**, Carlsen discloses a switch for use in a network of switches, the switch comprising: two or more ingress ports; two or more egress ports; a switch fabric for selectively coupling data packets received at one or more of the ingress ports to one or more of the egress ports *(page 1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric is a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_qorts (fabric ports) on the switch.*

Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL); selection means, for selectively routing a received data packet to the storage in dependence on the detected desired destination of the packet *(page 3, space is created for status and routing information that must be transmitted along with the data within the switch 100. More specifically, as each frame passes through PPD 130, the PPD 130 generates information about the frame's port speed, its priority value, the internal switch destination address (or SDA) for the source port 112 and the destination port 114).*

Carlsen discloses all aspects of the claimed invention, except *storage for, in response to a request for storage of data packets destined for a downstream congested port, storing selected data packets, and request generation means arranged to send a request to a further upstream port to request storage of data packets destined for the congested port at said further upstream port when a threshold amount of data packets are stored in the storage.*

Lyon is the same field of invention teaches storage for, in response to a request for storage of data packets destined for a downstream congested port, storing selected data packets *(page 2, at the downstream device also typically includes an enqueue process and a dequeue process, the enqueue process may entail examining headers (connection, cell loss priority, cell type, etc.), retrieving connection context (destination queue, connection discard state, etc.), determining whether to discard a cell based on congestion or discard state, enquiring undiscarded cells, and updating statistics as appropriate).*

Carlsen and Lyon are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Lyon because it is providing a method of managing traffic at a device in a packet-based network, receiving packets; for a received packet: identifying a queue of a separate queuing device into which packet is enqueueable, identifying resulting in an identified queue; retrieving congestion state information received from separate queuing device; and optionally discarding packet based on retrieved congestion state information; and forwarding undiscarded packets towards separate queuing device).

Furthermore, Gupta is the same field of invention teaches and request generation means arranged to send a request to a further upstream port to request storage of data packets destined for the congested port at said further upstream port when a threshold amount of data packets are stored in the storage*(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades(ports))*.

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Regarding **Claim 27**, Carlsen discloses all aspects of the claimed invention, except *a switch according to claim 26, in which the selection means comprises a content addressable memory.*

Lyon is the same field of invention teaches a switch according to claim 26, in which the selection means comprises a content addressable memory *(page 4, The contents of the memory 54 are a shadow copy of the contents of memory at the queuing device 70).*

Regarding **Claim 28**, Carlsen discloses all aspects of the claimed invention, except *wherein a set aside queue is only formed in response to the request if one or more of a number of criteria are satisfied.*

Lyon is the same field of invention teaches wherein a set aside queue is only formed in response to the request if one or more of a number of criteria are satisfied *(page 9, send packets to the network processor 42 based on criteria other than whether layer 3 processing or traffic management functions are to be performed on the packet).*

Regarding **Claim 35**, Carlsen discloses A network of interconnected switches connected in a topology, the network comprising a plurality of switches wherein at least two of the switches are switches according to claim 26*(page 1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric is a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_qorts (fabric ports) on the switch. Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL).*

11. **Claims 29-34** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Lyon et al (US 20050147032, Jul. 7, 2005) furthermore Gupta et al. (US 7286552, Oct. 23, 2007)

Regarding **Claim 29**, Carlsen discloses a switch for use in a network of switches, the switch comprising: a plurality of ingress ports for receiving data packets *(page 9,*

data entering the switch from a plurality of ingress ports); and, control means for selectively routing data packets received at one or more of the ingress ports to one or more of the egress ports *(page 3, routing information that must be transmitted along with the data within the switch 100. More specifically, as each frame passes through PPD 130, the PPD 130 generates information about the frame's port speed, its priority value, the internal switch destination address (or SDA) for the source port 112 and the destination port 114)*.

Carlsen discloses all aspects of the claimed invention, except *wherein at least one of the ingress ports or egress ports comprises storage for storing details of a congestion tree comprising at least three connected ports in which in use, the switch is located; a plurality of output ports for transmitting data packets.*

Lyon is the same field of invention teaches wherein at least one of the ingress ports or egress ports comprises storage for storing details of a congestion tree comprising at least three connected ports in which in use, the switch is located *(page 2,a computer-readable medium storing instructions which, when performed by an upstream device in a packet-based network, cause said device to: receive packets; for each received packet: identify a queue of a separate queuing device into which said packet is enqueueable, said identifying resulting in an identified queue; retrieve congestion state information received from said separate queuing device; and optionally discard said packet based on said retrieved congestion state information; and forward undiscarded packets towards said separate queuing device)*.

Carlsen and Lyon are analogous art because they are from the same field of

endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Lyon because it is providing a method of managing traffic at a device in a packet-based network, receiving packets; for a received packet: identifying a queue of a separate queuing device into which packet is enqueueable, identifying resulting in an identified queue; retrieving congestion state information received from separate queuing device; and optionally discarding packet based on retrieved congestion state information; and forwarding undiscarded packets towards separate queuing device).

Furthermore, Gupta is the same field of invention teaches a plurality of output ports for transmitting data packets *(column 1, a plurality of input/output cards (ports) that receive, buffer, and transmit data packets).*

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane

Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Regarding **Claim 30**, Carlsen discloses A switch according to claim 29, in which at least one of the ingress or egress ports comprises means for generating a set aside queue for storage of received data packets destined for a port in the congestion tree *(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114)*

Regarding **Claim 31**, Carlsen discloses the request containing information about a congested route between the switch and the downstream port *(page 1, This flow control technique monitors the congestion status of all destination ports at the downstream switch. If a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).*

Carlsen discloses all aspects of the claimed invention, except *at least one of the ingress or egress ports is adapted in use to generate a set aside queue in response to a request received by the ingress or egress port containing information about congestion at a downstream port.*

Lyon is the same field of invention teaches at least one of the ingress or egress ports is adapted in use to generate a set aside queue in response to a request received by the ingress or egress port containing information about congestion at a downstream port*(page 2, at the downstream device also typically includes an enqueue process and a dequeue process, the enqueue process may entail examining headers (connection, cell loss priority, cell type, etc.), retrieving connection context (destination queue, connection discard state, etc.), determining whether to discard a cell based on congestion or discard state, enquiring undiscarded cells, and updating statistics as appropriate),*

Regarding **Claim 32**, Carlsen discloses A switch according to claim 29, in which at least one of the ingress or egress ports comprises an ingress or egress engine adapted in use to receive a data packet; determine from the data packet its eventual destination *(page 2, mask is utilized at each ingress to the switch, each XOFF mask receives the XOFF signal, and assigns the designated destination port to the indicated XOFFKON status. The XOFF mask maintains the status for every destination port in a look up table that assigns a single bit to each port. If the bit assigned to a port is set to*

"1," the port has an XOFF status. If the bit is "0," the port has an XON status and is free to receive data).

Carlsen discloses all aspects of the claimed invention, except *and, if the data packet is destined for a congested port to store the packet in the set aside queue, and if it is destined for an uncongested port to store the packet in a cold queue for transmission to the uncongested port.*

Gupta is the same field of invention teaches if the data packet is destined for a congested port to store the packet in the set aside queue*(column 8, egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)* and if it is destined for an uncongested port to store the packet in a cold queue for transmission to the uncongested port *(column 8, The local egress queue manager 106 resumes normal dequeuing of packets from the local backplane queues destined for Blade 4 only after all of the backplane queues of other blades destined for Blade 4 are also not congested).*

Regarding **Claim 33**, Carlsen discloses all aspects of the claimed invention, except *the ingress or egress engine are embodied in a content addressable memory.*

Gupta is the same field of invention teaches the ingress or egress engine are embodied in a content addressable memory*(column 11-12, The computer executable instructions written in a computer programming language or embodied in firmware*

logic, or in hardware such as in an application specific integrated circuit (ASIC)).

Regarding **Claim 34**, Carlsen discloses a switch according to claim 32, the switch being controllable, when connected in a network of switches to execute the method of congestion management within a switch or network of connected switches wherein the or each of the switches has a plurality of ingress ports and a plurality of egress ports *(page 1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric can be a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_qorts (fabric ports) on the switch. Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL)*, the method comprising: when congestion is detected at a first ingress or egress port*(page 1, If a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected)*, sending a message to an upstream port connected to the first ingress or egress port indicating that congestion has occurred at a particular port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream switch will then stop sending data on the affected virtual channel(particular port))* and requesting storage at

the upstream port of data packets destined for that port*(page 3, See Fig 1, shows block 180 data packets stored in ingress memory subsystem (IMS) destined for that port, the iMS 180 assigns this packet a packet ID (or "PID") that indicates the cell buffer address in the iMS 180 where the packet is stored)*.

Carlsen discloses all aspects of the claimed invention, except *and, in dependence on the amount of data packets destined for the congested port stored at said upstream port; sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the congested port, said further upstream port storing at said further upstream port data packets destined for the congested port.*

Gupta is the same field of invention teaches in dependence on the amount of data packets destined for the congested port stored at said upstream port *(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)*, sending from the upstream port to a further upstream port a message informing said further upstream port of the congestion at the congested port, said further upstream port storing at said further upstream port data packets destined for the congested port*(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a*

new congestion message to all of the other blades(ports)).

12. **Claims 36-38** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Gupta et al. (US 7286552, Oct. 23, 2007)

Regarding **Claim 36**, Carlsen discloses a signaling protocol for managing congestion within a network of switches*(page 1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric can be a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_qorts (fabric ports) on the switch. Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL)*, the protocol comprising: a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream switch will then stop sending data on the affected virtual channel(particular port))*.

Carlsen discloses all aspects of the claimed invention, except *the first message requesting storage of data packets received by said upstream port destined for the congested port; and, a second message for sending by the upstream port to a port further upstream when a threshold amount of data packets destined for the congested port have been received and stored by the said upstream port, said message requesting storage of data packets destined for the congested port received by said further upstream port.*

Gupta is the same field of invention teaches the first message requesting storage of data packets received by said upstream port destined for the congested port*(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)*; and, a second message for sending by the upstream port to a port further upstream when a threshold amount of data packets destined for the congested port have been received and stored by the said upstream port, said message requesting storage of data packets destined for the congested port received by said further upstream port*(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades(ports)).*

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Regarding **Claim 37**, Carlsen discloses a protocol according to claim 36, wherein when storage is requested by either a message from the congested port or the message form said upstream port *(page 3, See Fig 1, shows block 180 data packets stored in ingress memory subsystem (IMS) destined for that port, the iMS 180 assigns this packet a packet ID (or "PID") that indicates the cell buffer address in the iMS 180 where the packet is stored).*

Carlsen discloses all aspects of the claimed invention, except *said upstream port and said further upstream port respectively are controlled to allocate a set aside queue at said upstream port or at said further upstream port respectively for storage of data packets destined for the congested port.*

Gupta is the same field of invention teaches said upstream port and said further upstream port respectively are controlled to allocate a set aside queue at said upstream port or at said further upstream port respectively for storage of data packets destined for the congested port*(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades(ports)).*

Regarding **Claim 38**, Carlsen discloses wherein when the set-aside-queue at either or both of said upstream port and said further upstream port have become empty said set-aside-queue may be deallocated *(page 7, a force defer signal that is controlled by the microprocessor 124 is also able to cause the defer signal 414 to go on. When the defer signal 414 is set, it informs the header select logic 406 and the remaining elements of the queue module 400 that the port 110 having the address on next frame header output 415 is congested, and this frame should be stored on the deferred queue 402).*

13. **Claims 39-41** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Lyon et al (US 20050147032, Jul. 7, 2005) furthermore Gupta et al. (US 7286552, Oct. 23, 2007)

Regarding **Claim 39**, Carlsen discloses an end station for use in a network of interconnected switches, the end station comprising: an ingress port for receiving data packets from a network to which in use the end station is connected*(page1, Fibre Channel is used to connect one or more computers or workstations together with one or more storage devices. In the language of Fibre Channel, each of these devices is considered a node. One node can be connected directly to another, or can be interconnected such as by means of a Fibre Channel fabric. The fabric can be a single Fibre Channel switch, or a group of switches acting together. Technically, the N_port (node ports) on each node are connected to F_ports (fabric ports) on the switch. Multiple Fibre Channel switches can be combined into a single fabric. The switches connect to each other via E-Port (Expansion Port) forming an interswitch link, or ISL)*; in which the egress port means operable in use to receive a message from a downstream port*(page5, see Fig 4, FIG. 4 shows two switches 260, 270 that are communicating over an interswitch link 230. The ISL 230 connects an egress port 114 on upstream switch 260 with an ingress port 112 on downstream switch 270, egress receive message from downstream port).*

Carlsen discloses all aspects of the claimed invention, except *an egress port for providing data packets to a network to which in use the end station is connected, the message containing data relating to a congested port downstream and a request to provide storage for data packets destined for the congested port downstream.*

Gupta is the same field of invention teaches an egress port for providing data packets to a network to which in use the end station is connected *(column6, the egress*

queues 112 and ingress queues 110 are respectively connected to numerous ports 11S and 120, which serve as the router's physical link to the rest of the network).

Carlsen and Gupta are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Gupta because it is providing an egress queue manager that receives a message from another blade further propagates the message to the ingress queue manager on its own blade, where the message causes the ingress queue manager to reduce the rate at which packets are dequeued from any of the ingress queues on that blade that may also be responsible for the congestion, the egress queue manager reduces the rate at which packets are enqueued to the backplane port mapped to congested backplane Queue, in which as a result, quality of service policies are propagated across the switched backplane.

Furthermore, Lyon is the same field of invention teaches the message containing data relating to a congested port downstream and a request to provide storage for data packets destined for the congested port downstream*(page 2, at the downstream device also typically includes an enqueue process and a dequeue process, the enqueue process may entail examining headers (connection, cell loss priority, cell type, etc.), retrieving connection context (destination queue, connection discard state, etc.), determining whether to discard a cell based on congestion or discard state, enquiring undiscarded cells, and updating statistics as appropriate).*

Carlsen and Lyon are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Lyon because it is providing a method of managing traffic at a device in a packet-based network, receiving packets; for a received packet: identifying a queue of a separate queuing device into which packet is enqueueable, identifying resulting in an identified queue; retrieving congestion state information received from separate queuing device; and optionally discarding packet based on retrieved congestion state information; and forwarding undiscarded packets towards separate queuing device).

Regarding **Claim 40**, Carlsen discloses a control device operable in use to, in response to the message received from the network *(page4, The queue control module 400 handles the queuing and ordering of data)*.

Carlsen discloses all aspects of the claimed invention, except *allocate a set-aside queue for storing of data packets destined for the congested port.*

Gupta is the same field of invention teaches allocate a set-aside queue for storing of data packets destined for the congested port *(column 8, The messaging system 101, when the traffic for the subchannel to the destination blade causing the congestion, e.g. Blade 4, is exceeding its capacity, then eventually some other backplane queue on another blade will become congested, and the egress queue manager on that blade will send a new congestion message to all of the other blades*

(ports)).

Regarding **Claim 41**, Carlsen discloses adapted for use within the signaling protocol of for managing congestion within a network of switches*(A congestion notification mechanism(signaling protocol) provides a congestion status for all destinations in a switch at each ingress port)*, the protocol comprising: a first message for sending from a first port at which congestion is detected to an upstream port connected to the first port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream switch will then stop sending data on the affected virtual channel(particular port))*, the first message requesting establishment at the upstream port of a set aside queue*(page 5, the upstream switch by performing flow control for the virtual channel 240 assigned to that V-I-Q 282).*

Carlsen discloses all aspects of the claimed invention, except *for storing data packets received by the upstream switch destined for the source of congestion, the message including a token for storage by said upstream port.*

Gupta is the same field of invention teaches for storing data packets received by the upstream switch destined for the source of congestion, the message including a token for storage by said upstream port *(column 17, at process block 402, the egress queue manager 106 receives a congestion message 124 that uniquely identifies a congested egress queue (B, P, Q) whose multicast scheduling flag 114(token) has been*

set. The congestion message 124 may have been generated by the egress queue manager 106 on the local blade B or another source blade in the router. At decision block 404, the egress queue manager 106 further determines whether the port P identified in the congestion message identifier (B, P, Q) is a backplane port 11SB or an outer port 11SA. When the port P is a backplane port 11SB, then the congested egress queue 112 is a backplane queue 112B. This implies that the backplane 104 is congested for all of the traffic (multicast or unicast) destined to the destination blade B' that corresponds to the subchannel associated with the port P in the egress queue identifier (B, P, Q)).

14. **Claims 42-47** are rejected under 35 U.S.C 103(a) as being unpatentable over Carlsen et al (US 20050088969, Apr. 28, 2005) in view of Gupta et al. (US 7286552, Oct. 23, 2007), furthermore Lyon et al (US 20050147032, Jul. 7, 2005)

Regarding **Claim 42**, Carlsen discloses wherein data packets stored at said further upstream port are stored in a set aside queue for data packets destined for the congested port thereby establishing an original congestion tree*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*; and when a subsequent request for storage of data packets is received

at any of the ports in the original congestion tree in respect of congestion at a port further downstream than the root of the original congestion tree*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).*

Carlsen discloses all aspects of the claimed invention, except *wherein the step of requesting storage at the upstream port of data packets destined for the congested port; comprises requesting establishment of a set aside queue for storage of said data packets; accepting the request at the port such that data packets destined for said further downstream port are stored at the port at which the request was received thereby extending the congestion tree downstream.*

Gupta is the same field of invention teaches wherein the step of requesting storage at the upstream port of data packets destined for the congested port*(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)* comprises requesting establishment of a set aside queue for storage of said data packets*(column 16, At decision block 360, before resuming normal packet rates for dequeuing packets from the identified ingress queues, the ingress queue manager first checks whether congestion on all of the egress queues to which the identified ingress queues can send has now subsided).*

Furthermore, Layon is the same field of invention teaches accepting the request at the port such that data packets destined for said further downstream port are stored at the port at which the request was received thereby extending the congestion tree downstream*(page 2, at the downstream device also typically includes an enqueue process and a dequeue process, the enqueue process may entail examining headers (connection, cell loss priority, cell type, etc.), retrieving connection context (destination queue, connection discard state, etc.), determining whether to discard a cell based on congestion or discard state, enquiring undiscarded cells, and updating statistics as appropriate).*

Carlsen and Lyon are analogous art because they are from the same field of endeavor of access to a service device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Carlsen to include the teaching of Lyon because it is providing a method of managing traffic at a device in a packet-based network, receiving packets; for a received packet: identifying a queue of a separate queuing device into which packet is enqueueable, identifying resulting in an identified queue; retrieving congestion state information received from separate queuing device; and optionally discarding packet based on retrieved congestion state information; and forwarding undiscarded packets towards separate queuing device).

Regarding **Claim 43**, Carlsen discloses upon receipt of a request for establishment of a set aside queue at any of said ports in said original congestion tree

creating an entry in a memory at the said port to indicate that congestion has occurred at a particular port*(page 1, a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch, the upstream switch will then stop sending data on the affected virtual channel(particular port))*; and checking data packets subsequently received at the said port against the entry in the memory and, if a data packet is directed to the congested port, storing said data packet in the corresponding set aside queue; and if a data packet is not directed to the or another congested port*(page 4, See Fig 1,shows queue control module 400 which shows The queue control module 400 has four primary components, namely the deferred queue 402, the backup queue 404, the header select logic 406, and the XOFF mask 408, these components work in conjunction with the XON History register 420 and the cell credit manager or credit module 440 to control ingress queuing and to assist in managing flow control within switch 100. The deferred queue 402 stores the frame headers and locations in buffer memory 320 for frames waiting to be sent to a destination port 114).*

Carlsen discloses all aspects of the claimed invention, except *storing the data packet in a cold queue for onward transmission.*

Gupta is the same field of invention teaches storing the data packet in a cold queue for onward transmission *(column 8, The local egress queue manager 106 resumes normal dequeuing of packets from the local backplane queues destined for Blade 4 only after all of the backplane queues of other blades destined for Blade 4 are*

also not congested).

Regarding **Claim 44**, Carlsen discloses establishing a set aside queue in response to every request for establishment of a set aside queue received at the port, the newly established set aside queue existing concurrently with any already existing set aside queues*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).*

Regarding **Claim 45**, Carlsen discloses when a request is for establishment of a set aside queue in respect of a port further downstream than the root of the original congestion tree*(page 5,See Fig 4, FIG. 4 also shows a virtual input queue structure 282 within each ingress port 112 in downstream switch 270. Each of these V-I-Qs 282 corresponds to one of the virtual channels 240 on the ISL 230 link, which in turn corresponds to one of the 0-COS-Qs 280 on the upstream switch)*, placing a link in an existing set aside queue to later activate the newly established set aside queue.

Regarding **Claim 46**, Carlsen discloses overwriting the shortest existing set aside queue with a newly established set aside queue *(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a*

destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).

Carlsen discloses all aspects of the claimed invention, except *a request is for establishment of a set aside queue in respect of a port further upstream than the root of the original congestion tree; and placing a link in the cold queue to the newly established set aside queue.*

Gupta is the same field of invention teaches if a request is for establishment of a set aside queue in respect of a port further upstream than the root of the original congestion tree*(column 8,egress queue manager 106 has received congestion notifications from the egress queue managers 106 on Blades 5 and 9, indicating that their backplane queues destined for Blade 4 are congested)*,and placing a link in the cold queue to the newly established set aside queue *(column 8, The local egress queue manager 106 resumes normal dequeuing of packets from the local backplane queues destined for Blade 4 only after all of the backplane queues of other blades destined for Blade 4 are also not congested).*

Regarding **Claim 47**, Carlsen discloses if a request is for establishment of a set aside queue in respect of a port further downstream than the root of the original congestion tree*(page 5,See Fig 4, FIG. 4 also shows a virtual input queue structure 282 within each ingress port 112 in downstream switch 270. Each of these V-I-Qs 282 corresponds to one of the virtual channels 240 on the ISL 230 link, which in turn*

corresponds to one of the 0-COS-Qs 280 on the upstream switch), overwriting the existing shortest set aside queue with a newly established set aside queue corresponding to the received request*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel)*; and placing a link to the newly established set aside queue in the already existing set aside queue that is the longest already existing set aside queue and that is shorter than the newly established set aside queue*(page 1, flow control technique monitors the congestion status of all destination ports at the downstream switch, if a destination port becomes congested, the flow control process determines which virtual channel on the ISL is affected, and sends an XOFF message so informing the upstream switch. The upstream switch will then stop sending data on the affected virtual channel).*

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are:

- Mullendore et al. (US 20030185154, Oct. 2, 2003) teaches network Congestion management Systems And Methods

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IQBAL ZAIDI whose telephone number is (571)270-3897. The examiner can normally be reached on 7:30a.m to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NGO RICKY can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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